AMENDMENTS TO THE SPECIFICATION

Paragraph [0002] is sought to be amended as follows:

[0002] In a computer network, plural computer systems are joined together to exchange information and share resources. Thus, a computer network is a distributed computing environment in which networked computer systems provide users with the capabilities of access to distributed resources, for example, remote files and databases or remote printers, and to distributed processing, for example, where an application is processed on two or more computer systems. In such a distributed computing environment, the components of an application may reside on different machines but work together. For example, each work station in a computer network often provides a user interface and local analysis and data processing, while larger, host computers, for example, a file server or mainframe, may maintain a large set of data files, coordinate access to large databases and perform larger scale data processing. In another distributed computing environment, an instance of an application is distributed to plural computers within the network. Such a network can more ~~reliability~~ reliably perform a requested task by having a second instance of an application available to perform the task in the event that a first instance of the application is unavailable. Processes by which tasks are reassigned amongst plural instances of an application based upon availability of the instances shall hereafter be termed as "failover" processes. Similarly, by distributing requested tasks among plural instances of an application, any particular instance of the application will be less vulnerable to overloads. Processes by which tasks are distributed amongst plural instances of an application shall hereafter be termed as "load balancing" processes.

Paragraph [0042] is sought to be amended as follows:

[0042] When configuring request messages for delivery to the asynchronous messaging services 118 through 128, the asynchronous messaging service 116 utilizes the confirmation-on-delivery ("COD") functionality available as part of the MQ series messaging service. As a result, when the request message delivered to the asynchronous messaging service 118 has been removed from the trigger-initiated local queue by the synchronous messaging service 132, the queue manager for the asynchronous messaging service ~~188~~ 118 generates a COD message for transmission back to the asynchronous messaging service 116. Normally, the arrival of a COD message at the server messaging application, here, the asynchronous messaging service 116, would indicate the successful arrival of the request message at the client process, here, the application instance 152. In the embodiment of the invention disclosed herein, however, the asynchronous messaging service 118 is wrapped by the synchronous messaging service 132. As a result, as disclosed herein, the arrival of a COD message at the asynchronous messaging service 116 merely indicates that the request message has been successfully taken off of the local queue by the synchronous messaging service 132. Upon receipt of the message, the instance 152 processes the request message and generates a response message to be returned to the API 188. More specifically, the response message generated by the instance 152 is delivered to the asynchronous messaging service 118 via the synchronous messaging service 132. In turn, the asynchronous messaging service 118 transfers the response message to the asynchronous messaging service 116 in the manner previously described. Finally, the asynchronous messaging service 116 delivers the response message to the API 188 via the synchronous messaging service 130.

Paragraph [0045] is sought to be amended as follows:

[0045] As illustrated in FIG. 2a, the message distribution rules for request messages to be transferred to distributed application A are: (a) the mid-range server 104 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 112 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 114 shall receive all request messages received, by the asynchronous messaging service 116, within a third time span which encompasses a contiguous range of values which extends from ~~40~~ 41 and 60 seconds after each minute. Upon receipt of a request message from the API 188 which is to be processed by the distributed application A, the asynchronous messaging service 116 first checks the time at which the request message was received. The asynchronous messaging service 116 then reviews the data file 200 associated with the distributed application A to determine which one of the mid-range servers 104, 112 and 114 on which instances of the distributed application A reside should received the request message. To select one of the mid-range servers 104, 112 and 114, the asynchronous messaging service 116 compares the seconds unit of the time of receipt of the message to the time spans respectively assigned to each one of the mid-range servers 104, 112 and 114. Upon determining which of the mid-range servers 104, 112 and 114 is assigned to the matching time span, the asynchronous messaging service 116 will initiate the transfer of the request message to the selected mid-range server. Thusly, the asynchronous messaging service 116 rotates the instances of the distributed application to receive a series of request messages based upon the time at which the

asynchronous messaging service 116 received each of the request messages.

Paragraph [0049] is sought to be amended as follows:

[0049] In accordance with another example of the failover rules governing selection of a subsequent mid-range server, if: (a) the value of the seconds unit of the arrival time of a request message is between zero and twenty seconds and the data file 200 indicates that both the mid-range servers 104 and 112 have failed; or (b) the value of the seconds unit of the arrival time of a request message is between twenty-**one** and forty seconds and the data file 200 indicates that the mid-range server 112 has failed, the asynchronous messaging service 116 will select the mid-range server 114, which, as may be further seen in FIG. 2a, is assigned to the time span encompassing the contiguous range of values between forty-**one** and sixty seconds, as the subsequent mid-range server.

Paragraph [0050] is sought to be amended as follows:

[0050] In still another example of the failover rules governing selection of a subsequent mid-range server, if: (a) the value of the seconds unit of the arrival time of a request message is between twenty-**one** and forty seconds and the data file 200 indicates that both the mid-range servers 112 and 114 have failed; or (b) the value of the seconds unit of the arrival time of a request message is between forty-**one** and sixty seconds and the data file 200 indicates that the mid-range server 114 has failed, the asynchronous messaging service 116 will select the mid-range server 104, which, as may also be seen in FIG. 2a, is assigned to the time span encompassing the contiguous range of values between zero and twenty seconds, as the subsequent mid-range server.

Paragraph [0051] is sought to be amended as follows:

[0051] In still yet another example of the failover rules governing selection of a subsequent mid-range server, if the value of the seconds unit of the arrival time of a request message is between forty-**one** and sixty seconds and the data file 200 indicates that the mid-range servers 114 and 104 have failed, the asynchronous messaging service will select the mid-range server 112, which, as may also be seen in FIG. 2a, is assigned to the time span encompassing the contiguous range of values between twenty-**one** and forty seconds, as the subsequent mid-range server. A final failover rule governing selection of a subsequent mid-range server is that, if the value of the seconds unit of the arrival time of a request message is between (a) zero and twenty seconds; (b) twenty-**one** and forty seconds; or (c) forty-**one** and sixty seconds; and the data file 200 indicates that the mid-range servers 104, 112 and 114 have all failed, a subsequent mid-range server will not be selected.

Paragraph [0053] is sought to be amended as follows:

[0053] FIG 2b is a graphical representation of the data file 202. As may now be seen, the data file 202 maintains load balancing and failover information for Application B for periodic access by the asynchronous messaging service 116. As before, load balancing is maintained between the plural servers on which instances of an application reside using a time-distribution technique employing one or more message distribution rules and one or more failover rules. As illustrated in FIG. 2b, the message distribution rules for request messages to be transferred to distributed application B are: (a) the mid-range server 104 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 106 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 112 shall receive all request messages received, by the asynchronous messaging service 116, between ~~40~~ 41 and 60 seconds after each minute.

Paragraph [0055] is sought to be amended as follows:

[0055] Thus, if the mid-range server 104 has failed, the asynchronous messaging service 116 will select the mid-range server 106 to receive all request messages received up to 40 seconds after each minute and select the mid-range server 112 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. Conversely, if the mid-range server 106 has failed, the asynchronous messaging application will select the mid-range server 104 to receive all request messages received up to 20 seconds after each minute and select the mid-range server 112 to receive all request messages received between ~~20~~ 21 and 60 seconds after each minute. If the mid-range server 112 has failed, the asynchronous messaging application 116 will select the mid-range server 104 to receive all request messages received up to 20 seconds after each minute, select the mid-range server 106 to receive all request messages received between ~~20~~ 21 and 40 seconds after each minute and select the mid-range server 104 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. If both the mid-range servers 104 and 106 have failed, the asynchronous messaging application 116 will select the mid-range server 112 to receive all request messages received between zero and 60 seconds after each minute. If both the mid-range servers 104 and 112 have failed, the asynchronous messaging application 116 will select the mid-range server 106 to receive all request messages received between zero and sixty seconds after each minute. If both the mid-range servers 106 and 112 have failed, the asynchronous messaging application 116 will select the mid-range server 104 to receive all request messages received between zero and sixty seconds after each minute.

Paragraph [0056] is sought to be amended as follows:

[0056] FIG 2c is a graphical representation of the data file 204. As may now be seen, the data file 204 maintains load balancing and failover information for Application C for periodic access by the asynchronous messaging service 116. As before, load balancing is maintained between the plural servers on which instances of an application reside using a time-distribution technique employing one or more message distribution rules and one or more failover rules. As illustrated in FIG. 2c, the message distribution rules for request messages to be transferred to distributed application C are: (a) the mid-range server 104 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 106 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 108 shall receive all request messages received, by the asynchronous messaging service 116, between ~~40~~ 41 and 60 seconds after each minute.

Paragraph [0058] is sought to be amended as follows:

[0058] Thus, if the mid-range server 104 has failed, the asynchronous messaging service 116 will select the mid-range server 106 to receive all request messages received up to 40 seconds after each minute and select the mid-range server 108 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. Conversely, if the mid-range server 106 has failed, the asynchronous messaging application will select the mid-range server 104 to receive all request messages received up to 20 seconds after each minute and select the mid-range server 108 to receive all request messages received between ~~20~~ 21 and 60 seconds after each minute. If the mid-range server 108 has failed, the asynchronous messaging application 116 will select the mid-range server 104 to receive all request messages received up to 20 seconds after each minute, select the mid-range server 106 to receive all request messages received between ~~20~~ 21 and 40 seconds after each minute and select the mid-range server 104 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. If both the mid-range servers 104 and 106 have failed, the asynchronous messaging application 116 will select the mid-range server 108 to receive all request messages received between zero and 60 seconds after each minute. If both the mid-range servers 104 and 108 have failed, the asynchronous messaging application 116 will select the mid-range server 106 to receive all request messages received between zero and sixty seconds after each minute. If both the mid-range servers 106 and 108 have failed, the asynchronous messaging application 116 will select the mid-range server 104 to receive all request messages received between zero and sixty seconds after each minute.

Paragraph [0059] is sought to be amended as follows:

[0059] FIG 2d is a graphical representation of the data file 206. As may now be seen, the data file 206 maintains load balancing and failover information for Application D for periodic access by the asynchronous messaging service 116. As before, load balancing is maintained between the plural servers on which instances of an application reside using a time-distribution technique employing one or more message distribution rules and one or more failover rules. As illustrated in FIG. 2d, the message distribution rules for request messages to be transferred to distributed application D are: (a) the mid-range server 106 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 108 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 110 shall receive all request messages received, by the asynchronous messaging service 116, between ~~40~~ 41 and 60 seconds after each minute.

Paragraph [0061] is sought to be amended as follows:

[0061] Thus, if the mid-range server 106 has failed, the asynchronous messaging service 116 will select the mid-range server 108 to receive all request messages received up to 40 seconds after each minute and select the mid-range server 110 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. Conversely, if the mid-range server 108 has failed, the asynchronous messaging application will select the mid-range server 106 to receive all request messages received up to 20 seconds after each minute and select the mid-range server 110 to receive all request messages received between ~~20~~ 21 and 60 seconds after each minute. If the mid-range server 110 has failed, the asynchronous messaging application 116 will select the mid-range server 106 to receive all request messages received up to 20 seconds after each minute, select the mid-range server 108 to receive all request messages received between ~~20~~ 21 and 40 seconds after each minute and select the mid-range server 106 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. If both the mid-range servers 106 and 108 have failed, the asynchronous messaging application 116 will select the mid-range server 110 to receive all request messages received between zero and 60 seconds after each minute. If both the mid-range servers 106 and 110 have failed, the asynchronous messaging application 116 will select the mid-range server 108 to receive all request messages received between zero and sixty seconds after each minute. If both the mid-range servers ~~109~~ 108 and 110 have failed, the asynchronous messaging application 116 will select the mid-range server 106 to receive all request messages received between zero and sixty seconds after each minute.

Paragraph [0062] is sought to be amended as follows:

[0062] FIG 2e is a graphical representation of the data file 208. As may now be seen, the data file 208 maintains load balancing and failover information for Application E for periodic access by the asynchronous messaging service 116. As before, load balancing is maintained between the plural servers on which instances of an application reside using a time-distribution technique employing one or more message distribution rules and one or more failover rules. As illustrated in FIG. 2e, the message distribution rules for request messages to be transferred to distributed application E are: (a) the mid-range server 108 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 110 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 112 shall receive all request messages received, by the asynchronous messaging service 116, between ~~40~~ 41 and 60 seconds after each minute.

Paragraph [0064] is sought to be amended as follows:

[0064] Thus, if the mid-range server 108 has failed, the asynchronous messaging service 116 will select the mid-range server 110 to receive all request messages received up to 40 seconds after each minute and select the mid-range server 112 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. Conversely, if the mid-range server 110 has failed, the asynchronous messaging application will select the mid-range server 108 to receive all request messages received up to 20 seconds after each minute and select the mid-range server 112 to receive all request messages received between ~~20~~ 21 and 60 seconds after each minute. If the mid-range server 112 has failed, the asynchronous messaging application 116 will select the mid-range server 108 to receive all request messages received up to 20 seconds after each minute, select the mid-range server 110 to receive all request messages received between ~~20~~ 21 and 40 seconds after each minute and select the mid-range server 108 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. If both the mid-range servers 108 and 110 have failed, the asynchronous messaging application 116 will select the mid-range server 112 to receive all request messages received between zero and 60 seconds after each minute. If both the mid-range servers 108 and 112 have failed, the asynchronous messaging application 116 will select the mid-range server 110 to receive all request messages received between zero and sixty seconds after each minute. If both the mid-range servers 110 and 112 have failed, the asynchronous messaging application 116 will select the mid-range server 108 to receive all request messages received between zero and sixty seconds after each minute.

Paragraph [0065] is sought to be amended as follows:

[0065] FIG 2f is a graphical representation of the data file 210. As may now be seen, the data file 210 maintains load balancing and failover information for Application F for periodic access by the asynchronous messaging service 116. As before, load balancing is maintained between the plural servers on which instances of an application reside using a time-distribution technique employing one or more message distribution rules and one or more failover rules. As illustrated in FIG. 2f, the message distribution rules for request messages to be transferred to distributed application F are: (a) the mid-range server 110 shall receive all request messages received, by the asynchronous messaging service 116, within a first time span which encompasses a contiguous range of values which extends from zero to 20 seconds after each minute; (b) the mid-range server 112 shall receive all request messages received, by the asynchronous messaging service 116, within a second time span which encompasses a contiguous range of values which extends from ~~20~~ 21 to 40 seconds after each minute; and (c) the mid-range server 114 shall receive all request messages received, by the asynchronous messaging service 116, between ~~40~~ 41 and 60 seconds after each minute.

Paragraph [0067] is sought to be amended as follows:

[0067] Thus, if the mid-range server 110 has failed, the asynchronous messaging service 116 will select the mid-range server 112 to receive all request messages received up to 40 seconds after each minute and select the mid-range server 114 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. Conversely, if the mid-range server 112 has failed, the asynchronous messaging application will select the mid-range server 110 to receive all request messages received up to 20 seconds after each minute and select the mid-range server 114 to receive all request messages received between ~~20~~ 21 and 60 seconds after each minute. If the mid-range server 114 has failed, the asynchronous messaging application 116 will select the mid-range server 110 to receive all request messages received up to 20 seconds after each minute, select the mid-range server 112 to receive all request messages received between ~~20~~ 21 and 40 seconds after each minute and select the mid-range server 110 to receive all request messages received between ~~40~~ 41 and 60 seconds after each minute. If both the mid-range servers 110 and 112 have failed, the asynchronous messaging application 116 will select the mid-range server 114 to receive all request messages received between zero and 60 seconds after each minute. If both the mid-range servers 110 and 114 have failed, the asynchronous messaging application 116 will select the mid-range server 112 to receive all request messages received between zero and sixty seconds after each minute. If both the mid-range servers 112 and 114 have failed, the asynchronous messaging application 116 will select the mid-range server 110 to receive all request messages received between zero and sixty seconds after each minute.